

WHAT IS CLAIMED IS:

1. A wireless communication system for performing information transmission with a predetermined transmission frame period, wherein:
  - a first wireless unit transmits a ranging signal to a second wireless unit,
  - said second wireless unit returns a response signal to said first wireless unit after a lapse of a predetermined period since said second wireless unit receives the ranging signal, and
  - said first wireless unit measures a distance between said first wireless unit and said second wireless unit according to a propagation time between said first wireless unit and said wireless second unit, said propagation time being obtained from an elapsed time since said first wireless unit transmits the ranging signal.
2. A wireless communication system for performing information transmission with a predetermined transmission frame period, comprising:
  - ranging-signal transmission means for transmitting a ranging signal to a specific wireless unit in said wireless network;
  - response-signal reception means for receiving a response signal from said wireless unit after a lapse of a predetermined period since the ranging signal is transmitted; and
  - distance measurement means for measuring a distance therefrom to said wireless unit according to a

propagation time obtained from an elapsed time from a moment, at which the ranging signal is transmitted, to a moment at which the response signal is received.

- 5    3. A wireless communication method for performing information transmission with a predetermined transmission frame period, comprising the steps of:

transmitting a ranging signal to a specific wireless unit in said wireless network;

- 10        receiving a response signal from said wireless unit after a lapse of a predetermined period since the ranging signal is transmitted; and

measuring a distance to said terminal according to a propagation time obtained from an elapsed time from a moment, at which the ranging signal is transmitted, to a moment at which the response signal is received.

4. The wireless communication method according to claim 3, wherein:

- 20        the transmission frame period of said wireless network has a data period, in which a transmitting data is transmitted and received, and a ranging period in which a distance between wireless units, and

an operation of transmitting the ranging signal in said step of transmitting the ranging signal, and an operation of receiving the response signal in said step of receiving a response signal are performed by utilizing the ranging period.

- 30    5. The wireless communication method according to claim 3, wherein the ranging signal to be transmitted in said

step of transmitting a ranging signal consists of a single pulse signal or of a plurality of pulse signals.

6. The wireless communication method according to claim 3, wherein in said step of performing an operation of receiving the response signal, a reception gate is enabled after a lapse of an image elimination period, which is necessary for masking an image due to reflection of waves from an unintended object, and/or a lapse of a ranging delay time including a delay time caused in a signal processing in said wireless unit, in addition to a two-way propagation time of a pulse propagating between wireless units at a propagation velocity.

7. A wireless communication device for performing information transmission with a predetermined transmission frame period, comprising:

ranging signal reception means for receiving a ranging signal from a wireless unit of a wireless network; and

response signal transmission means for transmitting a response signal after a lapse of a predetermined time since the ranging signal is received.

8. A wireless communication method for performing wireless communication in a wireless network, comprising the steps of:

receiving a ranging signal from a wireless unit of said wireless network; and

transmitting a response signal after a lapse of a predetermined time since the ranging signal is received.

9. The wireless communication method according to claim 8, wherein:

the transmission frame period of said wireless network has a data period, in which a transmitting data is transmitted and received, and a ranging period in which a distance between wireless units, and an operation of receiving the ranging signal in said step of receiving a ranging signal, and an operation of transmitting the response signal in said step of transmitting a response signal are performed by utilizing the ranging period.

10. The wireless communication method according to claim 8, wherein in said step of transmitting a response signal, the response signal consisting of a single pulse signal or of a plurality of pulse signals is transmitted.

11. The wireless communication method according to claim 8, wherein in said step of performing an operation of transmitting a response signal, the response signal consisting of a sequence of a plurality of PN-coded pulse signals.

12. The wireless communication method according to claim 8, wherein in said step of performing an operation of transmitting a response signal, the response signal to be sent from said wireless unit is transmitted after a lapse of an image elimination period, which is necessary for masking an image due to reflection of waves from an unintended object, and/or a lapse of a ranging delay time

including a delay time caused in a signal processing in said wireless unit, in addition to a two-way propagation time of a pulse propagating between wireless units at a propagation velocity.

5

13. A computer program described in a computer-readable form in such a way as to execute an operation, which causes a wireless unit to perform information transmission with a predetermined transmission frame period, on a computer system, comprising the steps of:

transmitting a ranging signal to a specific wireless unit in said wireless network;

performing an operation of receiving a response signal from said wireless unit after a lapse of a predetermined period since the ranging signal is transmitted; and

measuring a distance to said terminal according to a propagation time obtained from an elapsed time from a moment, at which the ranging signal is transmitted, to a moment at which the response signal is received.

14. A computer program described in a computer-readable form in such a way as to execute an operation, which causes a wireless network to perform wireless communication, on a computer system, comprising the steps of:

receiving a ranging signal from a wireless unit of said wireless network; and

transmitting a response signal after a lapse of a predetermined time since the ranging signal is received.